

AN EXAMINATION OF INJURY PREVENTION TACTICS OF  
SELECTED YOUTH FOOTBALL PROGRAMS

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ABSTRACT

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In recent years, concussions and heat-related illnesses in football have become a growing problem. Youth football programs must make changes to provide a safer game for their athletes. The purpose of this study was to examine the best practices of injury prevention within the following youth football programs: Pop Warner, American Youth Football, and USA Football. Data were collected by accessing the websites of these three organizations and systematically analyzing injury prevention tactics with the use of a best practices matrix. The results indicated that positive steps were being taken to limit the number of concussions, while there was a lack of regulations to prevent heat-related illnesses.

Keywords: football, youth, concussions, heat, injury

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## Chapter 1

### INTRODUCTION AND REVIEW OF LITERATURE

#### Background of Study

In recent years, issues regarding safety and athletes' health in professional sports have trickled down to affect youth sport programs creating a higher concern for the safety of athletes. With the advancements in knowledge of human health and well-being, there have been greater efforts made in terms of injury prevention guidelines and tactics. In particular, the NFL has seen an increasing number of concussions over the past few seasons, which has been highlighted by the media and former players. The numbers of concussions per week that are diagnosed in the NFL has risen from 5.4 in 2009 to 8.4 in 2011 (Fainaru & Fainaru-Wada, 2012). This increase has triggered a movement to prevent the continued rise in number of concussions and to act with caution when dealing with younger athletes in high school football and youth football. Covassin, Elbin, and Sarmiento (2012) stated, "Youth athletes between the ages of 5 and 18 years account for 65% of all sports- and recreation-related traumatic brain injuries (including concussions) treated in US emergency departments annually" (p. 233).

Along with concussions, heat-related illnesses have also surfaced to the forefront of safety in programs involving younger football players. With the implementation of proper training, education, rule changes, and safety equipment, many sport-related injuries can be preventable. The purpose of this study was to examine the best practices of safety protocol and injury prevention in youth football programs.

## Review of Literature

Research for this review of literature was conducted at Robert E. Kennedy Library on the campus of California Polytechnic State University, San Luis Obispo. In addition to books and other resources, the following online databases were utilized: SPORTDiscus. In this review of literature, the topics of medical sport injuries and the use of prevention tactics will be discussed. The overview of medical sport injuries will include concussions and heat-related illnesses in the realm of high school and youth sport settings. The background information of injury prevention and uses of standard protocol will be discussed through tactics, guidelines, and the implementation of rule changes.

Concussions in sports continue to be a looming and dangerous issue. Alosco, Knecht, Glickman, Gunstad, and Bergeron (2012) reported, “An estimated 1.6 to 3.8 million sports-and recreation-related concussions occur each year” (p. 22). The high number of concussions includes an increase in the number of concussions in teenagers. Merkel and Molony (2012) stated, “The number of US emergency department visits for 14 to 19 year olds due to concussions has tripled from 1997 to 2007” (p. 243). Out of the alarmingly high increase in number of concussions in teenagers, sport-related injuries claimed between 30 and 58 percent of the total number of concussions during the ten years (Merkel & Molony).

Concussions can be difficult to identify and may happen at any given instance without an actual blow to the head. According to the Centers for Disease Control and Prevention (CDC, 2013), “A concussion is a type of traumatic brain injury, or TBI, caused by a bump, blow, or jolt to the head that can change the way your brain normally

works” (para. 1). In sports, many instances and actions, such as a motion, can lead to either a direct hit to the head and brain which may cause the head to whiplash.

Concussion symptoms may be hard to detect in some cases. Symptoms that an athlete may have a concussion include: dizziness, headache, vomiting, blurry vision, confusion, sensitivity to light or sound, and changes in mood (CDC, 2013, para. 3).

Out of all sports, football has seen the most attention for issues with concussions. Due to the challenge of accurately detecting concussions from both the players’ and coaches’ point of views, diagnosing concussions and following a set procedure has been a difficult task. Return to play guidelines, for when a player has been removed from a game for injury conditions, have been put into place by the National Football League and other states as well for their high school and youth programs. The “Lystedt Law” has been enforced or adapted by most states. The law requires that any player that is suspected of having a concussion be removed from the game immediately and may only be able to return once he or she has been cleared by a medical professional (L.M. Johnson, 2012). Professional organizations and most high school programs have further processes an athlete must complete. Merkel and Moloney (2012) stated, “A clinical exam, neuropsychologic testing, balance and symptom reports at rest and with exertion are all used to identify concussion resolution and implementation of a return to athletics program” (p. 245). Although these are not mandatory or may not be available, some form of protocol is established beforehand to correctly and efficiently allow an athlete to return to the field of play without further immediate injury to the brain.

In terms of the prevention of football-related concussions, the American Physical Therapy Association asserted that football helmets did not have an effect on a high school

athlete's risk of getting a concussion. Although the proper fitting and use of equipment is important, they discovered that neither the age nor brand of a football helmet played a role in minimizing concussions. However, there was a correlation between the standard mouth pieces given out by high schools and a lower rate of concussions compared to the custom fit or specialized mouth pieces ("Concussion risk," 2013).

Rule changes have also been implemented in football to lessen the number of concussions. As of the 2012 season, the NCAA has moved the kickoff starting lines up by five yards, limiting the distance the kicking team has between themselves and the ball (G. Johnson 2012). The reasoning behind the change is that the kickoff team will have less of a head start, decreasing the number of high speed collisions resulting from hits on kickoffs. By moving the kickoff starting line up by five yards, more kickoffs will result in touchbacks in which no contact is made. Another rule change to prevent head injuries involves the loss of a helmet during a play. If a player loses their helmet during the course of a play, the player cannot continue to be involved in any action on the field and must leave the game until the next play (G. Johnson, 2012). With these rule changes being implemented from the college level down to lower levels of high school and youth programs, actions are clearly being taken to address the issue of concussions in football.

Heat-related illnesses ranging from muscle cramps, dehydration, and heat strokes are another medical-related sports injury affecting high school and youth athletes. Merkel and Molony (2012) stated, "Heat stroke is the third highest exercise-related cause of death in high school students in the United States and thousands of emergency department visits a year are due to heat related illness" (p. 247). Of the large number of emergency room visits due to heat-related illnesses, nearly half of the individuals were



ages of 19 and younger with football players presented the greatest risk (Halvorson, 2011).

While heat strokes are one of the most extreme cases, there are multiple levels of heat-related illness. Heat cramps due to dehydration can cause muscle cramps, fatigue, and light-headedness. Heat exhaustion may cause nausea, vomiting, rapid pulse, and loss of coordination. Heat strokes can cause delirium, convulsions, and multiple system failure (Merkel & Molony, p. 248). For the most extreme cases of heat strokes, Rizzone, Diamond, and Gregory (2013) state that, “Immediate and rapid cooling should be performed, followed by instant activation of the 911 system and transport to a hospital facility for continued cooling and higher level care” (p. 146). Heat-related illnesses may be easier to detect than concussion symptoms; there are steps that should be immediately taken by the coaches, parents, or medical staff. For serious cases of heat-related illnesses, the player should be rapidly cooled down with any form of cold liquid or ice available while emergency medical personnel is being contacted (CDC, 2013, para. 4).

Heat-related illnesses are preventable with the proper education of coaches and players. At the conclusion of a study done on hydration and a high school football team, Yeargin et al. (2010) noted, “Athletes tend to underestimate fluid losses and overestimate their rehydration...coaches and medical professionals must provide good hydration protocols” (p. 145). The importance of hydration is well known throughout athletes, parents, and coaches. Besides the act of telling a player to drink more water, other tactics can be utilized to prevent any serious heat-related illness. Rizzone et. al (2013) suggested, “Some effective techniques include avoiding the use of heavy equipment or even practice itself in temperature of humidity extremes, wearing light-colored and loose-fitting

clothing, not using supplements or certain medications that can lead to dehydration...and not playing while ill” (p. 146).

Proper hydration is an important part of battling heat-related illnesses, but it can also be a difficult aspect for a younger athlete to judge on their own. The simple element of staying hydrated is replacing the fluids that are lost through sweating. After conducting a study on youth football players ranging from ages 5-19, McDermott et al. (2009) found that “Children replaced their fluid losses during practice but were unable to do so during games” (p. 549). This could be due to youth athletes disregarding their dehydration because of a higher focus on competition. In the same study, it was reported that youth athletes had lower sweat rates during practice compared to a higher level of sweat rates during games (McDermott et al.). This data illustrates the significance in players’ awareness to their own hydration levels. Coaches could play a factor as well in preventing dehydration by providing breaks for their player to re-hydrate before sending the player back in the game. This places a greater role in the education of coaches and parents on the importance of keeping their kids well hydrated.

In football, many athletes may be subjected to heat-related illnesses during the hot month of August when most high schools hold two-a-day practices. In 2009, the National Athletic Trainers Association made recommendations on cutting back or eliminating two-a-day practices. Alongside the cutting back of two-a-day practices, other recommendations made included: limiting practice time to three hours a day, allowing a three hour break between practices, and limiting full pads to just helmets for the first two days (Schroder, 2009, pg. 6). The guidelines provided by the American Academy of Pediatrics relating to limiting risks of heat illness include: the education of youth athletes,

coaches, and staff; protocols in place for trained personnel; easily and readily accessible water; appropriate modification of outdoor athletic activities; and a written emergency plan for managing heat strokes (Bergeron, 2013). These guidelines and tactics are currently being recommended to combat heat-related illnesses in high school and youth sport settings.

In recent years, the issues revolving concussion and heat-related illnesses in football ranging from professional to youth levels have been scrutinized. This has led to an increase in focus on injury prevention tactics to create a safer level of play for all involved.

### Purpose of the Study

The purpose of this study was to examine the best practices of safety protocol and injury prevention in youth football programs.

### Research Questions

This study attempted to answer the following research questions:

1. What are some of the rule changes implemented within the last five years to maintain a safe level of play?
2. What are the different ways that youth football programs are addressing the increasingly concerning issues regarding concussions?
3. What guidelines have been provided to address the issue of heat-related illnesses?

### Delimitations

This study was delimited to the following parameters:

1. Information on safety protocol in youth football programs was gathered from a variety of programs including Pop Warner, USA Football, and American Youth Football.
2. The implementation of new rules, equipment regulations, and concussion protocol were analyzed.
3. The data were collected during the fall of 2013.
4. Information for this study was gathered using resources from websites of varying youth football organizations.

## Chapter 2

### METHODS

The purpose of this study was to examine the best practices of safety protocol and injury prevention in youth football programs. This chapter includes the following sections: description of context, description of instrument, and description of procedures.

#### Description of Context

Best practices of safety and injury prevention in youth football were examined for three different youth football organizations: Pop Warner Football, USA Football, and American Youth Football. These three organizations are the most popular and found in several different regions throughout the nation. Pop Warner Football is the oldest among all youth sport organizations with over 240,000 participants; American Youth Football consists of over 16,000 teams and 574,000 participants (Miller & Washington, 2011). In 2010, there were three million youth athletes, ages 7-14, that participated in an organized tackle football program in the United States (USA Football, 2010). In the United States, an estimated 45 million children and adolescents are involved in some form of organized sport program (Veigel & Pleacher, 2008).

#### Description of Instrument

The instrument utilized in this study was a best practices matrix developed by the researcher (see Appendix A). The instrument was initially developed by the researcher with a list of questions and notes. The researcher created the questions through guidelines

and tactics of injury prevention discovered through the review of literature. The questions in the instrument focus on each organization's way of dealing with the issues of concussions and heat-related illnesses. Through the questions in the instrument, the researcher was able to document notes in a qualitative form for each youth football organization.

A pilot study was performed using the websites and safety manuals of other youth sport organizations consisting of Little League, US Youth Soccer, and USA Hockey National. After the pilot study, an adjustment was made to include a question regarding the availability of informational content through videos and other links.

#### Description of Procedures

Best practices of safety and injury prevention in youth football were examined for three different youth football organizations: Pop Warner Football, USA Football, and American Youth Football. The instrument utilized in this study was a best practices matrix developed by the researcher. The researcher systematically used the instrument by accessing the websites for each of the three separate youth football organizations. The results of safety guidelines and injury protocol were analyzed in qualitative form. This process was conducted from November 4, 2013 through November 8, 2013.

## Chapter 3

### PRESENTATION OF THE RESULTS

The purpose of this study was to examine the best practices of safety protocol and injury prevention in youth football programs. A best practices approach was utilized to examine the following youth football programs: Pop Warner Football, USA Football, and American Youth Football. This chapter includes the following sections: demographics, concussions, heat-related illnesses, and rule changes.

#### Overview of Selected Organizations

In 2010, there were three million youth athletes, ages 7-14, that participated in an organized tackle football program in the United States. Pop Warner Football is the nation's largest and oldest youth football organization. Pop Warner Football consists of over 240,000 participants; American Youth Football is responsible for over 16,000 teams and 574,000 participants. American Youth Football has programs in all 50 states and in several other countries. The researcher was not able to find the specific number of athletes with USA Football. They have a national program affiliated with the National Football League. USA Football provides national teams of under-15 and under-19 for flag football and tackle football.

#### Concussions

All three youth football organizations have placed emphasis in recent years on dealing with concussions. Pop Warner Football, USA Football, and American Youth

Football are in accordance with Lystedt Law for concussion protocol. In all three leagues, if a participant is removed from practice or a game with concussion symptoms, the player cannot resume play until they are cleared by a licensed medical professional. USA Football and American Youth Football provide excess information on concussions and their symptoms along with other information on proper tackling techniques and the importance of helmet fitting which can be found on their websites.

Pop Warner provides ample and specific information on their return to play guidelines for concussions. Although they do follow Lystedt Law for concussion protocol, the head coach is the person that makes the immediate evaluation and determination to remove a player from game situations. Pop Warner makes content available on concussion signs and symptoms by attaching a link to the Center of Disease Control (CDC) website for further information. Pop Warner does not mandate their coaches to go through any concussion course or training.

USA Football provides a comprehensive overview on safety by dedicating an entire page to concussion awareness. The page is broken down into segments: signs and symptoms, concussion articles, how to tackle, and equipment fitting. For all of these segments, articles and videos are made available to educate players, parents, and coaches on ways to prevent concussions. USA Football does not require their coaches to go through mandatory training for concussions.

American Youth Football does not provide any information on concussion symptoms or return to play guidelines on their website. However, American Youth Football has partnered with Axon sports to create baseline testing for neuro-cognitive functions for their athletes. This has made American Youth Football unique from other



programs with the help of technology to better protect their participants. They also require their coaches to complete the CDC Heads Up Online Concussion Training course and the passing of the CDC Concussion Test. They recommend coaches download a free app from the American Academy of Neurology to increase their knowledge and awareness on concussions.

### Heat-Related Illnesses

The researcher found mixed results for dealing with heat-related illnesses. All three programs provide no regulations on practices or games in high temperatures. The way practice is conducted during periods of high temperature is left up to the coach's discretion. Overall, the importance of hydration is made clear for parents and coaches.

Pop Warner highlights important facts and statistics on proper hydration. They provide a list of guidelines for coaches and parents to keep athletes safe in the heat. These guidelines include rehydration strategy and the signs of heat-related illnesses. However, there are no mandatory guidelines put in place. They advise coaches and parents to have an emergency plan in place which involves contacting medical professionals and having necessary means of an ice bath nearby in case an athlete suffers from heat stroke.

USA Football also does not have any policies in place to combat heat-related illnesses. They provide numerous articles on signs of dehydration and ways of preventing heat-related illness. Although there is ample information provided on the topic, they are only suggestions for coaches to follow. Some of these suggestions include scheduling practice during cooler times of the day and not wearing pads during days of intense heat. USA football provides coaches and parents with a free mobile app which details safety

issues. Among the safety issues addressed, there is information that covers the proper treatment of heat-related illnesses. An emergency action plan with detailed steps is provided.

American Youth Football does not provide any information on heat-related illnesses or proper hydration techniques on their website. The researcher found that although there are various coaches training courses made available through American Youth Football, no further information is given to parents or coaches to promote the hydration of participants.

### Rule Changes

For all three organizations, rule changes were made to prevent helmet-to-helmet contact. Any hits to the head are deemed illegal, and the importance of proper tackling techniques is stressed to coaches. Other rules are made by individual organizations to make the game safer for their athletes.

Pop Warner is the only organization to have made rule changes that limit contact during practices. As of 2012, athletes cannot participate in full speed head-on blocking or tackling drills with players lining up more than three yards apart. They also limit the amount of contact at each practice to either 40 minutes total for each individual practice or one-third of total weekly practice time.

As of the 2013 season, both USA Football and American Youth Football addressed the issue of a player's helmet coming off during a play. In both leagues, the player must leave the game for at least one play before returning to the field. The

reasoning behind the change was that this rule would allow for better enforcement of the proper fitting of helmets by coaches.

## Chapter 4

### DISCUSSION AND CONCLUSIONS

The significance of this study was to address the challenges that youth football programs face in regards to dealing with the issues of concussion and heat-related illnesses. This concluding chapter will include the following: a summary of the study, a discussion of the findings, limitations, conclusions based on research questions, and implications of the findings, and recommendations for future research.

#### Summary

In recent years, issues regarding the safety of athletes have surfaced from the professional level down to the youth level. Concussions and heat-related illnesses have been major points of discussion in football. The purpose of this study was to examine the safety procedures and protocol for concussions and heat-related illnesses in youth football programs. The programs that were involved in this study were Pop Warner Football, American Youth Football, and USA Football.

A best practices guide was formed to analyze the three different organizations in regards to the different safety precaution rules and procedures that were in place. The instrument made it possible for the researcher to collect results from each organization and document them in a qualitative format. The researcher systematically analyzed the three organizations by accessing their websites.

The findings of the study illustrated the different approaches by the organizations in dealing with concussions and heat-related illnesses among youth athletes. All three of the programs were in accordance with Lystedt Law for returning from concussions; they each demonstrated the importance of awareness and understanding of concussion symptoms by coaches, parents, and players. All three organizations provided information on hydration, but most did not delve deeper into the issues concerning heat-related illnesses. A couple of rule changes were made to limit the amount of contact during practices and to promote the proper fitting of helmets.

### Discussion

Pop Warner Football, American Youth Football, and USA Football have taken steps to address the issue of concussions in their programs. They all have provided information for coaches, parents, and players about concussion symptoms to increase awareness. Furthermore, all three organizations have placed an increased emphasis on establishing concussion protocol for athletes returning to the field of play. The subject of heat-related illnesses was recognized by Pop Warner and USA Football. However, there were no mandatory guidelines put in place for preventative purposes. Recent rule changes were established to promote the proper fitting of helmets. Pop Warner was the only organization to limit the amount of contact during practices. The teaching of proper tackling techniques has become a major point of emphasis across the three organizations. Overall, the tools that were used to promote a safer level of play involved the increase of awareness and education of concussions and proper tackling methods through various channels of articles, videos, phone applications, or coaching training courses.

For concussions, the three programs embraced the required changes. Lystedt Law requires athletes who may exhibit various levels of concussion symptoms to be removed from games or practices until they are cleared by a medical professional (L.M. Johnson, 2012). All three organizations actively enforced this protocol for their players. The partnership of American Youth Football and Axon Sports to establish baseline testing for neuro-cognitive functions illustrates the progressive steps that are being taken to create an accurate method for players that are returning from concussions. This clinical testing can be used to identify concussions and provide a better tracking method for a players returning to the field of play (Merkel & Moloney, 2012).

The latest studies revealed the dangers of heat-related illnesses as football players under the age of 19 present the greatest risk (Halvorson, 2011). In addition, guidelines have been suggested to limit practice times, limiting practices in full pads, and the cutting back or elimination of two-a-day practices (Schroder, 2009, p. 6). In terms of the prevention of heat-related illnesses, the findings from this study were inconsistent with prior research. Although the importance of hydration was made clear for all participants involved, there were no active steps or guidelines enforced to limit practice times. Some suggestions were made to wear lighter colored practice jerseys and not wearing full pads on days of extreme heat. However, this is completely left up to the coaches' discretion. Specific guidelines could be put in place based on the severity of weather conditions, especially during the hotter months of August and September. In addition, emergency procedures could be provided on websites for parents or coaches in the event of an athlete suffering from heat stroke.

Through these findings, it was clear there are proper actions being taken to combat the issue of concussions at the level of youth football. The emphasis on education and awareness of concussions, along with promoting the importance of proper tackling techniques, illustrates that the three organizations are committed to making the game safer for their athletes. The programs should continue to provide information to coaches and parents through the variety of website links, videos, and phone applications. Coaches can have the tendency to lose focus on safety issues, such as concussions, during games and the course of a season. Therefore, a mandatory meeting every year emphasizing the implications of concussions on their athletes may be necessary for coaches. American Youth Football provides the most advanced methods for diagnosing concussions with the use of neuro-cognitive baseline testing. It would be helpful for other programs to follow the lead on using this form of testing in future seasons.

The implementation of regulations and safety precautions to prevent heat-related illnesses may be needed. It could be helpful to encourage coaches not to hold practices on days of extreme heat or to schedule practices during later, cooler periods of the day. The organizations may want to look into scheduling weekend games during early mornings or late afternoons to avoid the hottest times of the day. In addition, leagues should provide their players with light-colored, mesh jerseys for practices and games. Overall, these organizations may seek to incorporate rules or regulations to limit practice times or full-padded practices to better address the issues regarding heat-related illnesses.

Since research on the subject was restricted to online means, the quantity and quality of data may have been impacted. Other limitations may have included the inaccessibility of specific material covered in any of the coaches' education courses that

the organizations may have offered. Information covered in these courses could have revealed a greater understanding on different points of emphasis regarding player safety. Despite these limitations, ample information on injury prevention was discovered by the researcher with the use of the three youth football organization's online sites.

Through this study of Pop Warner Football, American Youth Football, and USA Football, the researcher examined the best practices of safety procedures and protocol for concussions and heat-related illnesses. The study showed that advancements have been made in creating a safer game for young athletes. The issue of concussions has been heavily emphasized in recent years due to high-profile media interest, but there is room for further research and guidelines to prevent heat-related illnesses.

### Conclusions

Based on the findings of this study, the following conclusions are drawn:

1. Rule changes implemented in recent years involve limiting the amount of contact during practices, being in accordance with Lystedt Law, and the enforcement of proper fitting of helmets.
2. The various methods that youth football programs are utilizing to combat the issue of concussions include: increasing awareness of concussions for coaches, parents, and players; placing a higher emphasis on proper tackling techniques; limiting the amount of contact during practices; and providing baseline neuro-cognitive baseline testing.
3. There have been no measurable actions being taken to provide guidelines for dealing with the problems regarding heat-related illnesses.



## Recommendations

Based on the conclusions of this study, the following recommendations are made:

1. Continue to make information on concussions easily accessible through websites and phone applications.
2. Consider partnering with companies like Axon Sports to involve more neuro-cognitive baseline testing for concussion diagnosis.
3. Provide further instruction for heat strokes and install guidelines for days of extreme heat conditions.
4. Future research should examine further concussion protocol for athletes diagnosed with multiple concussions throughout their playing careers.
5. Consider making concussion training mandatory for coaches every season.
6. Further examination and modification of rules to prevent scenarios of unnecessary helmet-to-helmet contact.

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## APPENDIXES

## Appendix A

### Instrument

## Instrument

1. What is their concussion protocol?
2. Is there ample information provided for parents about safety precautions and symptoms specifically relating to concussions on their website?
3. Are there limits to practice times and hours within a day?
4. Does temperature affect game day operations or practice conditions? How so?
5. Is all equipment properly checked by coaches and officials before games?
6. What medical/training staff is available for practice and/or games?
7. Does the organization offer a safety training meeting for coaching staff? Is it mandatory?
8. What new rules have they developed for the safety of their athletes?
9. List other miscellaneous safety precaution the organization provides (Other links, videos, etc.)